

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A display system for a device, comprising:
computer executable instructions operable to:
 - receive images from a first sensor and a second sensor representing scenery outside the device;
 - detect moving objects in the images;
 - fuse the images to a single viewpoint;
 - transform the fused image to a first viewpoint image from a first operator station in the device and a second viewpoint image from a second operator station in the device, wherein the first and second viewpoint images conform to the scenery outside the device from each operator station; and
 - generate a third display area associated with at least two mutually exclusive windows of information on a display device for the first operator station, the display device is mounted in an instrument panel of the device and the third display area and the two mutually exclusive windows of information are presented on the display device;
 - generate a third display area associated with at least two mutually exclusive windows of information on another display device for the second operator station, the other display device is mounted in the instrument panel of the device and the third display area and the two mutually exclusive windows of information are presented on the display device;
 - wherein the third display areas can be customized independently by the operators to display detailed information related to the information displayed in the associated windows and the first and second viewpoint images are displayed on the respective display devices.

2. (Original) The display system of Claim 1, further comprising:
computer executable instructions operable to:
combine the first and second viewpoint images with symbols, wherein
the symbols represent information regarding the operational
state of the device and the moving objects detected in the
images.

3. (Original) The display system of Claim 1, wherein the instructions for
detecting moving objects in the first sensor image are configured to execute in a first
processor, and the instructions for detecting moving objects in the second sensor
image are configured to execute in a second processor simultaneously with the
instructions in the first processor.

4. (Original) The display system of Claim 3, wherein the instructions for
transforming the fused image to the first viewpoint image are configured to execute in
the first processor, and the instructions for transforming the fused image to the
second viewpoint image are configured to execute in the second processor.

5. (Original) The display system of Claim 2, wherein the symbols represent
the moving objects in the vicinity of the device.

6. (Original) The display system of Claim 2, wherein at least one of the first
and second viewpoint images include environmental information for the area where
the device is operating.

7. (Original) The display system of Claim 2, wherein the symbols represent
weather hazards in the vicinity of the device.

8. (Original) The display system of Claim 2, wherein the computer executable
instructions are further operable to receive an enhanced image from a third sensor
configured to provide an image of the out-the-window scenery in low-visibility
conditions

9. (Original) The display system of Claim 8, wherein the computer executable instructions are further operable to fuse the single viewpoint image with the enhanced image.

10. (Original) The display system of Claim 9, wherein the computer executable instructions are further operable to utilize data from at least one position sensor to determine the location of the objects with respect to the device.

11. (Original) The display system of Claim 2, wherein the computer executable instructions are further operable to utilize data from off-board data sources regarding the objects.

12. (Original) The display system of Claim 1, wherein the first sensor and the second sensor are video cameras.

13. (Original) The display system of Claim 8, wherein the third sensor is a RADAR sensor.

14. (Original) The display system of Claim 8, wherein the third sensor is a FLIR sensor.

15. (Canceled)

16. (Currently amended) A method for providing an out-the-window visual scene on a display device, comprising:

receiving an image of a portion of the out-the-window visual scene from the viewpoint of a first type of sensor;

receiving another image of a portion of the out-the-window visual scene from the viewpoint of another of the first type of sensor;

fusing the images from the first type of sensors into a combined image to generate a first fused image;

transforming the fused image to a first operator viewpoint and to a second operator viewpoint; and
outputting the first operator viewpoint image to a first display device and the second operator viewpoint image to a second display device, wherein the display devices are positioned in an instrument panel to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene, and the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene; and
generating a common display area associated with at least two mutually exclusive windows of information on each of the display devices, wherein the common display area can be customized by the operator to display detailed information related to the information displayed in the associated windows.

17. (Original) The method of Claim 16, further comprising detecting objects in the first fused image from the first type of sensor.

18. (Original) The method of Claim 17, further comprising combining the first fused image with symbols representing the objects.

19. (Original) The method of Claim 16, further comprising transforming the first operator viewpoint image and the second operator viewpoint image to conform to the out-the-window visual scene.

20. (Original) The method of Claim 16, further comprising fusing the first fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

21. (Original) The method of Claim 16, further comprising fusing the second fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

22. (Original) The method of Claim 21, further comprising: transforming the second fused image to the first operator viewpoint and to the second operator viewpoint.

23. (Original) The method of Claim 20, further comprising: providing portions of the transformed image with data from a terrain map database.

24. (Currently amended) A device, comprising:
a display device; and
a display processor operable to:

receive a first sensor image representing a portion of scenery outside the device;

transform the first sensor image to a viewpoint image from an operator station in the device, wherein the viewpoint image is sized and oriented to conform to the scenery outside the device from the operator station; and

output the first operator viewpoint image to the display device, wherein the display device is positioned in an instrument panel to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene, and the viewpoint image is aligned with and scaled to conform to the out-the-window visual scene;

wherein the display processor is further operable to generate a common display area associated with at least two mutually exclusive windows of information on the display device, wherein the common display area

can be customized by the operator to display detailed information related to the information displayed in the associated windows.

25. (Original) The device of Claim 24, wherein the display processor is further operable to combine the viewpoint image with symbols, wherein the symbols represent information regarding the operational state of the device and the moving objects detected in the images.

26. (Original) The device of Claim 24, wherein the display processor is further operable to detect moving objects in the first sensor image

27. (Original) The device of Claim 24, wherein the display processor is further operable to generate symbols representing moving objects in the sensor image and the operational state of the device.

28. (Original) The device of Claim 24, wherein the display processor is further operable to generate symbols representing weather hazards in the vicinity of the device.

29. (Original) The device of Claim 24, wherein the display processor is further operable to receive an enhanced image of the out-the-window scenery in low-visibility conditions from a second sensor.

30. (Original) The device of Claim 29, wherein the display processor is further operable to fuse the viewpoint image with the enhanced image.

31. (Original) The device of Claim 26, wherein the display processor is further operable to utilize data from at least one position sensor to determine the location of the objects with respect to the device.

32. (Original) The device of Claim 26, wherein the display processor is further operable to utilize data from off-board data sources regarding the objects.

33. (Original) The device of Claim 24, wherein the sensor is a video camera.

34. (Original) The device of Claim 29, wherein the second sensor is a RADAR sensor.

35. (Original) The device of Claim 29, wherein the second sensor is a FLIR sensor.

36. (Canceled)

37. (Currently amended) An aircraft, comprising:
a crewstation with cockpit windows;
a first display device for one crewmember;
a second display device for another crewmember; and
a display processor operable to:
receive an image of an out-the-window visual scene from the viewpoint of a first type of sensor;
receive another image of a portion of the out-the-window visual scene from the viewpoint of another of the first type of sensor;
fuse the images from the first type of sensors into a combined image to generate a first fused image;
transform the fused image to a first operator viewpoint and to a second operator viewpoint;
transform the first operator viewpoint image and the second operator viewpoint image to conform to the size and orientation of the out-the-window visual scene; and
output the first operator viewpoint image to the first display device and the second operator viewpoint image to the second display device, wherein the display devices are positioned in an instrument panel to provide the portion of a desired out-the window visual scene in combination with a cockpit window that provides another portion of the desired out-the-

window visual scene, and the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene;
wherein the display processor is further operable to generate a common display area associated with at least two mutually exclusive windows of information on each display device, wherein the common display area can be customized by the operator to display detailed information related to the information displayed in the associated windows.

38. (Original) The aircraft of Claim 37, wherein the display processor is further operable to detect objects in the first fused image from the first type of sensor.

39. (Original) The aircraft of Claim 38, wherein the display processor is further operable to combine the first fused image with symbols representing the objects and primary flight information for the aircraft.

40. (Canceled)

41. (Original) The aircraft of Claim 37, wherein the display processor is further operable to fuse the first fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

42. (Original) The aircraft of Claim 41, wherein the display processor is further operable to fuse the second fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

43. (Original) The aircraft of Claim 42, wherein the display processor is further operable to transform the second fused image to the first operator viewpoint and to the second operator viewpoint.

44. (Original) The aircraft of Claim 43, wherein the display processor is further operable to provide portions of the transformed images using data from a terrain map database.

45. (Original) The aircraft according to Claim 37 further comprising: a terrain database coupled to provide the display processor with at least a portion of the required out-the-window field of view on the display device.

46. (Original) The aircraft of Claim 37, wherein the display processor is further operable to display one of the operator viewpoint displays to the operator acting as pilot in command of the aircraft during a predefined aircraft operational state, and to allow the pilot in command to choose an option on the display device to view detailed information about the aircraft and aircraft subsystems during other aircraft operational states.

47. (Canceled)

Authorization for this examiner's amendment was given in a telephone interview with Mary Jo Bertani on 8/8/2007.

Allowable Subject Matter

Claims 1-14, 16-35, 37-39, and 41-46 are allowed.

The following is an examiner's statement of reasons for allowance: the cited prior art does not disclose or render obvious the combination of elements recited in the claims as whole.

Specifically, the cited prior art fails to disclose or render obvious the following limitations:

As per independent claim 1, the claimed:

"wherein the first and second viewpoints images conform to the scenery outside the device", "generate a third display area associated with at least two mutually exclusive windows of information on a display device", "wherein the third display areas can be customized independently", and "first and second viewpoint images are displayed on the respective display devices".

As per independent claims 16, 24, and 37, these claims are also allowed for the same reasons as independent claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Related Prior Art

US Patent 6,809,407 (Kulas): teaches of an out-of-the-window display that conforms with the outside scenery in figure 3 on display screen 102. However, the claims for this application are novel over Kulas, because the invention, as claimed, displays the viewpoint images conforming with outside scenery on the display in conjunction with the claimed: "third display area associated with at least two mutually exclusive windows of information on a display device" wherein the third display areas can be customized independently.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ulka Chauhan/
Supervisory Patent Examiner, Art Unit
2628

/Daniel Hajnik/

DFH